

Traffic Accident Prevention Research as a System Component

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ACCIDENT PREVENTION has lagged far behind other health fields in recognizing the potential contribution of research. In 1963, traffic accidents were the leading cause of death in the United States of persons between the ages of 1 and 37 (1). Yet, in 1965, private and governmental sources allocated only \$16.5 million for research in traffic accident prevention, as compared with a total expenditure for medical and health-related research of approximately \$1,850,000,000 (2).

Various explanations have been proposed for the apparent neglect of accident prevention research. Haddon and associates (3) explain the neglect as stemming from:

1. The belief that accidents are "acts of God" and outside of a cause and effect framework.
2. The necessity for "restrictions or prohibition of behavior that the culture prized" . . . such as the use of firearms or the motor vehicle.
3. "Threats to specific industries or the public as a whole" . . . as in vehicle design or seat-belt legislation.
4. The inertia associated with traditional and institutionalized approaches to accident prevention.
5. The psychological remoteness of accidents—the belief that accidents happen to "the other fellow."

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6. The sadistic satisfaction provided by accidents in a civilization where "Roman circuses, public executions, bear baiting," and the like are no longer available.

Neisser (4), in disagreeing with these explanations, states that:

1. The medical profession has a history of success. Not only has a wide range of diseases been effectively eliminated, but almost every adult American has experienced actual relief as a result of medical attention.
2. The mono-causal model may not be right for all "diseases," (e.g., cancer) but it is a reasonable basis on which the layman can generalize. . . . On the other hand, no crisply defined causal factor accounts for all auto accidents, or even for most.
3. Whenever a single cause for a class of accidents can be identified, as in the case of the refrigerators, public reaction is quick. The difference between refrigerator suffocations and highway accidents is not one of "psychological remoteness" but of common sense: the former are easily prevented, the latter are not.

A third type of explanation comes from accident prevention personnel, who often complain that researchers do research in order to impress other researchers . . . research reports are left to gather dust on library shelves . . . or that the research being carried out has little to do with the real problems in the accident prevention field.

All these explanations may be partially correct. In the development of the various scientific subfields, progress has generally been haphazard, uncoordinated, opportunistic and

uneven—depending largely on individuals or institutions working independently, who often duplicate each other's mistakes or discoveries. Major breakthroughs or crises have generally been necessary for significant increases in support and consolidation of a particular field.

Science has developed this way in the past. In accident prevention research, however, we cannot waste years waiting for the pieces of a fragmented research effort to fall into an effective whole while tens of thousands of lives continue to be lost annually in traffic accidents.

Estes (5), in discussing the progress of science, suggests that "The next step . . . is clearly to bring new techniques of science and management to bear upon science itself so that further improvements will represent not simply happy accidents but rather the unfolding of a master plan."

In accord with Estes, this paper presents a conceptual and administrative framework which identifies the principal elements preceding and following research. An awareness of these elements can facilitate the research undertaking from inception to eventual application.

The diagram represents the principal elements of the research context and the ways in which they could be systematically related to one another. The boxes represent activities; the solid lines represent the flow of information, influence, or funds; the dotted lines represent feedback.

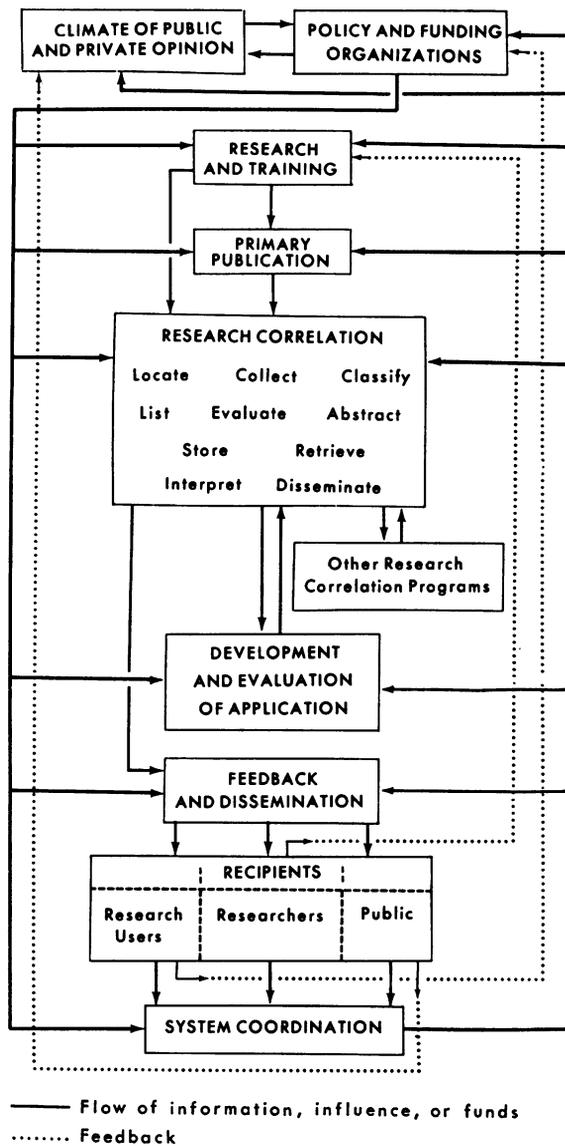
Public and Private Opinion

Large-scale support of research depends upon a favorable climate of opinion among members of the public, professionals, and officials that accident prevention is urgent. Research support depends also on the availability of needed resources and the likelihood that manmade solutions can be developed and applied to accident-prevention efforts.

Since such prerequisites for research as funds, personnel, and official and public concern are finite at any given time, there is a struggle, however implicit, for saliency among a variety of fields competing for these prerequisites.

The mass media and prominent public figures have kept people informed and optimistic about the likelihood that research may yield cures

The research context



for cancer, heart disease, and other disorders. That no parallel effort is currently being made for the support of accident-prevention research may account in part for the present apathy, or even underlying resistance, toward safety research.

Policy and Funding

Private and public policy and funding both follow and lead public opinion. They are limited, however, in the extent to which they can move ahead of the public. Only an aroused

public and officialdom has enabled the space program to receive the attention and support that it has today. Consider the public response if \$5,335,000,000—the estimated 1965 expenditure for space exploration (2)—had been allocated 10 years before the launching of Sputnik.

Research and Training

The hit-and-run research which has characterized segments of the accident prevention field does not develop the wisdom and insight needed for productive research. Permanent laboratories are necessary to assure continuity of research and of training.

To attract and hold researchers, agencies concerned with accident prevention must also provide their researchers with intellectual challenge and with opportunities for recognition, identity, and career development. The agencies need to foster the researchers' belief that their work has meaning—a large order, but anything less represents a token, rather than a realistic, attempt to develop an effective research effort.

Primary Publication

Research on traffic accident prevention is generally reported in the scientific journals of other fields, such as medicine and engineering. Other than *Traffic Safety Research Review*, no journals specialize in reporting accident-prevention research.

When the volume of research warrants, founding of accident prevention research journals within the various disciplines would be desirable—in medicine, engineering, psychology, and the like. It would also be desirable to have one or more interdisciplinary journals reprint articles of potential interest in fields other than that of original publication.

Research Correlation

In traffic safety research, the National Safety Council maintains a research correlation project, which is supported in part by the U.S. Bureau of Public Roads and the Automotive Safety Foundation. Staff of the project locate, collect, classify, list, abstract, evaluate, store,

retrieve, interpret, and disseminate traffic research, with emphasis on behavioral research. A newly developed mechanized storage and retrieval system at the office of the Highway Research Board of the National Academy of Sciences provides additional coverage of traffic safety research with emphasis on highway and traffic studies. The National Safety Council's correlation project functions as a specialized input to the Highway Research Board system.

Traffic safety research is included in the Science Information Exchange and the MEDLARS system of the National Library of Medicine, as well as in the other information sources. Of necessity, however, this coverage of traffic safety research is not complete.

Developing and Evaluating Applications

One major weakness in accident prevention is the lack of resources for systematic perusal of completed research and for development and testing of its applications.

In contrast with industry, the development function is largely left to individual interest and initiative. Within the organizations concerned with accident prevention, additional units similar to the Office of Research and Development of the Bureau of Public Roads are needed, which will have as their sole responsibility the analysis of completed research and the development and testing of applications.

Feedback and Dissemination

At present a basic question remains unanswered: Who should receive what accident research information, in what form, for what purpose? No systematic program exists for communicating needed information in a form appropriate to the skills and interests of the recipient.

Ideally, research users, such as licensing agencies, police and highway departments, and other government units, would receive nontechnical abstracts of research reports and technical specifications so that they could apply such research. A series of workshops for the various groups of users would make them more aware of the possibilities in research and inform them of specific applications. The volume of mail

crossing an administrator's desk is generally so great that if unsolicited technical communications are to receive consideration, appropriate followup communications, often face to face, have to be made. Workshops would serve this purpose.

Researchers generally like to receive technical abstracts of research reports for perusal and initial study of a specific subject. Reprints of complete articles also need to be available.

To properly inform the public of research results, a variety of means could be used—short, topical summaries for the popular press and magazines, feature-length articles for Sunday supplements and popular magazines, and movies for schools, clubs, and television. In other fields of health these techniques and media have been widely used. It is a rare newspaper or magazine which does not periodically and optimistically report results of research on cancer, heart disease, and similar studies.

System Coordination

Finally, coordination of research and related activities should not be left to chance. There is a place for a unit which has the responsibility for encouraging voluntary cooperation within a broad and flexible master plan. By keeping the various elements of the system fully informed and arranging opportunities for exchange of information, such a unit could bring about closer cooperation. This unit could be responsible also for finding the answer to a fundamental and generally ignored question, To what extent do the combined efforts of the units of the system contribute to the prevention of accidents?

Summary

Recognition of the importance of research in traffic accident prevention has come more slowly than in other health fields. There are many possible reasons for this lag. As in the initial

stages of development of other research fields, progress has been haphazard and uncoordinated. Effective integration and application of research in traffic accident prevention is urgent. Almost 50,000 lives continue to be lost annually in traffic accidents in the United States.

Scientific and management techniques can be applied to science itself. Significant activities which may influence research from conception to application can be recognized and provided for. The period of relatively unproductive and haphazard growth characteristic of a new scientific research area can thus be considerably shortened.

Therefore a conceptual and administrative framework based on an analysis of accident prevention research is presented. Administrative elegance cannot, of course, substitute for fundamental insights, well-designed experiments, or carefully analyzed and interpreted results. If, within such a framework, however, a master plan for accident prevention research and its application can be developed, perhaps some conditions responsible for the current neglect and ineffectiveness of safety research can be eliminated.

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